WHAT IS CLAIMED IS:

1. A method of determining cell viability, comprising:

(a) obtaining a container loaded with deuterated materials;

(b) introducing cells into the container whereby the cells are in contact with the deuterated materials;

(c) obtaining vibrational spectra emitted by the cells;

wherein the vibrational spectra emitted by the cells are indicative of metabolism, thereby providing an indication of viability of the cells, such that greater metabolic activity is indicative of greater viability.

2. The method of claim 1, wherein the vibrational spectra are Raman spectra.

3. The method of claim 1, wherein the vibrational spectra are infrared or near infrared spectra.

4. The method of claim 1, wherein the deuterated material is selected from the group consisting of α-D-glucose; 6,6- dideutero-α-D-glucose; D_2O; 3-O-methylglucose; 6,6- dideutero-α-D-3-O-trideuteromethylglucose; 6,6- dideutero-α-D-3-O-methylglucose; and 6,6- dideutero -α-D-2-O-methylglucose.

5. The method of claim 1, wherein the deuterated material comprises a deuterated amino acid.

6. The method of claim 2, further comprising normalizing the Raman spectra obtained by comparing the Raman spectra obtained at a target wavenumber to the Raman spectra obtained at a reference wavenumber.

7. The method of claim 6, wherein the target wavenumber is 960 cm^{-1}, 1270 cm^{-1} or 2400-2600 cm^{-1}.

8. The method of claim 6, wherein the reference wavenumber is the amide I Raman feature (1600-1700 cm^{-1}).

9. The method of claim 6, wherein the reference wavenumber is the CH_2 Raman feature (1450 cm^{-1}).

10. The method of claim 6, wherein the reference wavenumber is the CH stretch Raman feature (2900-3000 cm^{-1}).

11. The method of claim 6, wherein the reference wavenumber is the amide III Raman feature (1200-1350 cm^{-1}).

12. The method of claim 6, wherein the reference wavenumber is the integral of all the Raman features (300-1850 cm^{-1}).

13. The method of claim 2, further comprising normalizing the Raman spectra obtained by comparing the Raman spectra obtained at a target wavenumber to the fluorescence generated by a Raman excitation source.

14. The method of claim 13, wherein the fluorescence is the H_2O fluorescence (980 nm).

15. The method of claim 1, wherein the container is a centrifuge tube.

16. A method of determining cell viability, comprising:

(a) obtaining a container loaded with deuterated materials;

(b) introducing cells into the container whereby the cells are in contact with the deuterated materials;

(c) obtaining vibrational spectra emitted by the cells;

(d) placing an aliquot of the cells into a medium free of deuterated materials;

(e) obtaining vibrational spectra emitted by the cells in the non-deuterated medium;

(f) determining the rate of decrease of emitted vibrational spectra;

wherein the vibrational spectra are indicative of metabolism, thereby providing an indication of viability of the cells, such that a faster rate of decrease of emitted vibrational spectra is indicative of greater viability.